

densities of +17.0 dBW/4 kHz per carrier and maximum antenna input power densities of -8.0 dBW/4 kHz shall be processed routinely in accordance with Declaratory Order in the Matter of Routine Licensing of Earth Stations in the 6 GHz and 14 GHz Bands Using Antennas Less than 9 Meters and 5 Meters in Diameter, Respectively, for Both Full Transponder and Narrowband Transmissions, 2 FCC Rcd 2149 (1987) (Declaratory Order).

\* \* \*

(b) *VSAT networks operating in the 11.7-12.2 GHz and 14.0-14.5 GHz band.* Each applicant for digital and/or analog VSAT network authorization proposing to use transmitted satellite carrier EIRP densities and/or maximum antenna input power in excess of those specified in paragraph (a) of this Section must comply with the procedures set forth in § 25.220.

(c) [Reserved.]

(d) An application for VSAT authorization shall be filed on FCC Form 312, Main Form and Schedule B.

(e) VSAT operators in the 11.7-12.2 GHz and 14.0-14.5 GHz frequency bands are permitted to use more than one hub earth station in their networks.

(f) VSAT operators in the 11.7-12.2 GHz and 14.0-14.5 GHz frequency bands are permitted to use temporary fixed earth stations as either hub earth stations or remote earth stations in their networks, but must specify the number of temporary fixed earth stations they plan to use in their networks at the time of their applications.

§ 25.144 [Amended]

12. In §25.144, remove and reserve paragraph (a)(1).

13. Amend § 25.151 by revising paragraphs (c)(2) and (d), and adding paragraph (e) to read as follows:

§ 25.151 Public notice period.

\* \* \* \* \*

(c) \* \* \*

(2) For temporary authorization pursuant to § 25.120.

\* \* \* \* \*

(d) Except as specified in paragraph (e) of this section, no application that has appeared on public notice will be granted until the expiration of a period of thirty days following the issuance of the public notice listing the application, or any major amendment thereto. Any comments or petitions must be delivered to the Commission by that date in accordance with §25.154.

(e)(1) Applicants seeking authority to operate a temporary fixed earth station pursuant to §25.277 may consider their applications "provisionally granted," and may initiate operations upon the placement of the complete FCC Form 312 application on public notice, provided that

- (i) The temporary fixed earth station will operate only in the conventional Ku-band (14.0-14.5 GHz and 11.7-12.2 GHz bands);
- (ii) The temporary fixed earth station's operations will be consistent with all routine-licensing requirements for the conventional Ku-band; and
- (iii) The temporary fixed earth station's operations will be limited to satellites on the Permitted Space Station List.

(2) Applications for authority granted pursuant to paragraph (e)(1) of this section shall be placed on public notice pursuant to paragraph (a)(1) of this section. If no comments or petitions are filed within 30 days of the public notice date, the authority granted will be considered a regular temporary fixed earth station authorization as of 30 days after the public notice date. If a comment or petition is filed within 30 days of the public notice date, the applicant must suspend operations immediately pending resolution of the issues raised in that comment or petition.

14. Amend § 25.154 by revising paragraphs (c) and (d) and adding paragraph (e) to read as follows:

§ 25.154 Oppositions to applications and other pleadings.

\* \* \* \* \*

(c) Except for opposition to petitions to deny an application filed pursuant to § 25.220 of this chapter, oppositions to petitions to deny an application or responses to comments and informal objections regarding an application may be filed within 10 days after the petition, comment, or objection is filed and must be in accordance with other applicable provisions of §§ 1.41 through 1.52 of this chapter, except that such oppositions must be filed electronically through the International Bureau Filing System (IBFS) in accordance with the applicable provisions of Part 1, Subpart Y of this Chapter.

(d) Except for opposition to petitions to deny an application filed pursuant to § 25.220 of this chapter, reply comments by the party that filed the original petition may be filed with respect to pleadings filed pursuant to paragraph (c) of this section within 5 days after the time for filing oppositions has expired unless the Commission otherwise extends the filing deadline and must be in accordance with other applicable provisions of §§ 1.41 through 1.52 of this chapter, except that such reply comments must be filed electronically through the International Bureau Filing System (IBFS) in accordance with the applicable provisions of Part 1, Subpart Y of this Chapter.

(e) If a petition to deny an application filed pursuant to § 25.220 is filed, the applicant must file a statement with the Commission explaining whether the applicant has resolved all outstanding issues raised by the petitioner, within 30 days of the date the petition for deny is filed. This statement must be in accordance with the provisions of §§ 1.41 through 1.52 of this chapter applicable to oppositions to petitions to deny, except that such reply comments must be filed electronically through the International Bureau Filing System (IBFS) in accordance with the applicable provisions of Part 1, Subpart Y of this Chapter.

15. Revise § 25.201 by adding introductory language, and by adding the following definitions in alphabetical order to read as follows:

§25.201 Definitions.

Definitions for terms in subpart C of this part appear in this section, and in § 2.1 of this chapter.

\* \* \* \* \*

C-band. For purposes of this part, the terms "C-band" and "conventional C-band" refer specifically to the 3700-4200 MHz downlink and 5925-6425 MHz uplink frequency bands. These paired bands are allocated to the Fixed-Satellite Service and are also referred to as the 4/6 GHz band(s).

\* \* \*

Electronic filing. The submission of applications, exhibits, pleadings, or other filings to the Commission in an electronic form using *Internet* or *World Wide Web* on-line filing forms.

\* \* \*

Equivalent diameter. When circular aperture reflector antennas are employed, the size of the antenna is generally expressed as the diameter of the antenna's main reflector. When non-reflector or non-circular aperture antennas are employed, an equivalent diameter can be computed for the antenna. The equivalent diameter is the diameter of a hypothetical circular aperture antenna with the same aperture area as the actual antenna. For example, an elliptical aperture antenna with major axis,  $a$ , and minor axis,  $b$ , will have an equivalent diameter of  $[a \times b]^{1/2}$ . A rectangular aperture antenna with length,  $l$ , and width,  $w$ , will have an equivalent diameter of  $[4(l \times w)/\pi]^{1/2}$ .

\* \* \*

Ku-band. In this rule part, the terms "Ku-band" and "conventional Ku-band" refer specifically to the 11700-12200 MHz downlink and 14000-14500 MHz uplink frequency bands. These paired bands are allocated to the Fixed-Satellite Service and are also referred to as the 12/14 GHz band(s).

\* \* \*

Permitted Space Station List. A list of satellites operating in the C-band and/or Ku-band including all U.S.-licensed satellites and those non-U.S.-licensed satellites for which the Commission has authorized routine U.S.-licensed earth stations to communicate with that satellite, and the satellite operator has requested the Commission to place its satellite on the Permitted Space Station List.

\* \* \*

Power flux density. The amount of power flow through a unit area within a unit bandwidth. The units of power flux density are those of power spectral density per unit area, namely watts per hertz per square meter. These units are generally expressed in decibel form as dB(W/Hz/m<sup>2</sup>), dB(W/m<sup>2</sup>) in a 4 kHz band, or dB(W/m<sup>2</sup>) in a 1 MHz band.

\* \* \*

Power spectral density. The amount of an emission's transmitted carrier power falling within the stated reference bandwidth. The units of power spectral density are watts per hertz and are generally expressed in decibel form as dB(W/Hz), dB(W/4kHz), or dB(W/1MHz).

\* \* \*

Routine processing or licensing. A licensing process whereby applications are processed in an expedited fashion. Such applications must be complete in all regards and consistent with all Commission Rules and must not raise any policy issues. With respect to earth station licensing, an application is "routine" only if it conforms to all antenna, power, coordination, radiation hazard, and FAA notification rules, and accesses only "Permitted Space Station List" satellites in the conventional C-band or Ku-band frequency bands.

\* \* \* \* \*

§ 25.202 [Amended]

16. In § 25.202, remove and reserve paragraph (a)(2).

17. In §25.204, revise paragraphs (a) and (b) to read as follows:

§ 25.204 Power limits.

(a) In bands shared coequally with terrestrial radio communication services, the equivalent isotropically radiated power transmitted in any direction towards the horizon by an earth station, other than an ESV, operating in frequency bands between 1 and 15 GHz, shall not exceed the following limits except as provided for in paragraph (c) of this section:

+40 dBW in any 4 kHz band for  $\theta \leq 0^\circ$

+40 + 3 $\theta$  dBW in any 4 kHz band for  $0^\circ < \theta \leq 5^\circ$

where  $\theta$  is the angle of elevation of the horizon viewed from the center of radiation of the antenna of the earth station and measured in degrees as positive above the horizontal plane and negative below it.

(b) In bands shared coequally with terrestrial radiocommunication services, the equivalent isotropically radiated power transmitted in any direction towards the horizon by an earth station operating in frequency bands above 15 GHz shall not exceed the following limits except as provided for in paragraph (c) of this section:

+64 dBW in any 1 MHz band for  $\theta \leq 0^\circ$

+64 + 3 $\theta$  dBW in any 1 MHz band for  $0^\circ < \theta \leq 5^\circ$

where  $\theta$  is as defined in paragraph (a) of this section.

\* \* \* \* \*

18. In § 25.209, revise paragraph (f), to read as follows:

§25.209 Antenna performance standards.

\* \* \* \* \*

(f) An earth station with an antenna not conforming to the standards of paragraphs (a) and (b) of this section will be authorized after February 15, 1985 upon a finding by the Commission that unacceptable levels of interference will not be caused under conditions of uniform 2° orbital spacing. An earth station antenna initially authorized on or before February 15, 1985 will be authorized by the Commission to continue to operate as long as such operations are found not to cause unacceptable levels of adjacent satellite interference. In either case, the Commission will impose appropriate terms and conditions in its authorization of such facilities and operations. The applicant has the burden of demonstrating that its antenna not conforming to the standards of paragraphs (a) and (b) of this section will not cause unacceptable interference. This demonstration must comply with the procedures set forth in § 25.220.

\* \* \* \* \*

19. In § 25.210, revise the introductory language in paragraph (a) to read as follows:

§ 25.210 Technical requirements for space stations in the Fixed-Satellite Service.

(a) All space stations in the Fixed-Satellite Service used for domestic service in the 3700-4200 MHz and 5925-6425 MHz frequency bands shall:

\* \* \* \* \*

20. In § 25.211, revise the section heading and paragraph (d), and add paragraphs (e) and (f), to read as follows:

§25.211 Analog video transmissions in the Fixed-Satellite Services.

\* \* \* \* \*

(d) An earth station may be routinely licensed for transmission of full transponder video analog services provided:

- (1) In the 5925-6425 MHz band, with an antenna equivalent diameter 4.5 meters or greater, the maximum input power into the antenna does not exceed 26.5 dBW; or
- (2) In the 14.0-14.5 GHz band, with an antenna equivalent diameter of 1.2 meters or greater, the maximum input power into the antenna does not exceed 27 dBW.

(e) Antennas smaller than those specified in paragraph (d) of this section are subject to the provisions of Section 25.220 of this Chapter, which may include power reduction requirements. These antennas will not be routinely licensed for transmission of full transponder services.

(f) Each applicant for authorization for analog transmissions in the fixed-satellite service proposing to use maximum power into the antenna in excess of those specified in Section 25.211(d), must comply with the procedures set forth in § 25.220 of this Chapter.

21. In § 25.212, revise the section heading and paragraphs (c) and (d), and add new paragraph (e), to read as follows:

§ 25.212 Narrowband analog transmissions, digital transmissions, and video transmissions in the GSO Fixed-Satellite Service.

\* \* \* \* \*

(c) In the 14.0-14.5 GHz band, an earth station with an antenna equivalent diameter of 1.2 meters or greater may be routinely licensed for transmission of narrowband analog services with bandwidths up to 200 kHz if the maximum input power spectral density into the antenna does not exceed -8 dBW/4 kHz and the maximum transmitted satellite carrier EIRP density does not exceed 13 dBW/4 kHz. Such earth stations may be routinely licensed for transmission of narrowband and/or wideband digital services, including digital video services, if the maximum input spectral power density into the antenna does not exceed -14 dBW/4 kHz and the maximum transmitted satellite carrier EIRP density does not exceed +6.0 dBW/4 kHz. Antennas with a smaller major or minor axis in the 14 GHz band are subject to the provisions of §25.220 of this chapter, which may include power reduction requirements.

(d) In the 5925-6425 MHz band, an earth station with an equivalent diameter of 4.5 meters or greater may be routinely licensed for transmission of SCPC services if the maximum power densities into the antenna do not exceed +0.5 dBW/4 kHz for analog SCPC carriers with bandwidths up to 200 kHz, and do not exceed -2.7 dBW/4 kHz for narrow and/or wideband digital SCPC carriers. Antennas with an equivalent diameter smaller than 4.5 meters in the 5925-6425 MHz band are subject to the provisions of §25.220 of this chapter, which may include power reduction requirements.

(e) Each applicant for authorization for transmissions in the fixed-satellite service proposing to use transmitted satellite carrier EIRP densities, and/or maximum antenna input power densities in excess of those specified in paragraph (c) of this Section in the 14.0-14.5 GHz band, or in paragraph (d) of this Section in the 5925-6425 MHz band, respectively, must comply with the procedures set forth in § 25.220 of this Chapter.

22. Revise Part 25 by adding new § 25.220 to read as follows:

§ 25.220 Non-conforming transmit/receive earth station operations.

(a)(1) This section applies to earth station applications other than ESV applications in which:

(i) The proposed antenna does not conform to the standards of §§25.209(a) and (b), and/or

(ii) The proposed power density levels are in excess of those specified in §25.134, §25.211, or §25.212, or those derived by the procedure set forth in paragraph (c)(1) of this section, whichever is applicable.

(2) Paragraphs (b) through (e) and (g) of this section apply to the earth station applications described in paragraph (a)(1) of this section, in which the applicant seeks transmit/receive authority.

(3) Paragraphs (f) and (g) of this section applies to the earth station applications described in paragraph (a)(1) of this section in which the applicant seeks transmit-only or receive-only authority.

(4) The requirements for petitions to deny applications filed pursuant to this section are set forth in § 25.154.

(b) If an antenna proposed for use by the applicant does not comply with the antenna performance standards contained in §25.209(a) and (b), the applicant must provide, as an exhibit to its FCC Form 312 application, the antenna gain patterns specified in §25.132(b).

(c) If an antenna proposed for use by the applicant does not comply with the performance standards contained in §25.209(a) and (b), the applicant must meet the requirements of either paragraph (c)(1) or (c)(2) of this section to obtain authority to transmit. The applicant must meet the requirements of paragraph (c)(3) of this section to obtain protection from receiving interference from adjacent satellite operators.

(1) The applicant must provide in its Form 312, Schedule B, the power and power density levels that result by reducing the values stated in §§ 25.134, 25.211, or 25.212, whichever is applicable, by the number of decibels that the non-compliant antenna fails to meet the antenna performance standard of §25.209(a) and (b), or

(2) The applicant will not be permitted to transmit to any satellite unless the applicant has provided the certifications listed in paragraph (e)(1) of this section from the operator of that satellite(s).

(3) The applicant will not receive protection from adjacent satellite interference from any satellite unless the applicant has provided the certifications listed in paragraph (d)(1) of this section from the operator of that satellite(s) from which it plans to receive.

(d)(1) If an antenna proposed for use by the applicant does not comply with the performance standards contained in §25.209(a) and (b), the applicant must submit the certifications listed in paragraphs (d)(1)(i) through (d)(1)(iv) of this Section to qualify for protection from receiving interference from other satellite systems. The applicant will be granted protection from receiving interference only with respect to the satellite systems included in the coordination agreements referred to in the certification required by paragraph (d)(1)(ii) of this section, and only to the extent that protection from receiving interference is afforded by those coordination agreements.

(i) A statement from the satellite operator acknowledging that the proposed operation of the subject non-conforming earth station with its satellite(s) has the potential to receive interference from adjacent satellite networks that may be unacceptable.

(ii) A statement from the satellite operator that it has coordinated the operation of the subject non-conforming earth station accessing its satellite(s), including its required downlink power density based on the information contained in the application, with all adjacent satellite networks within 6° of orbital separation from its satellite(s), and the operations will operate in conformance with existing coordination agreement for its satellite(s) with other satellite systems.

(iii) A statement from the satellite operator that it will include the subject non-conforming earth station operations in all future satellite network coordinations, and

(iv) A statement from the earth station applicant certifying that it will comply with all coordination agreements reached by the satellite operator(s).

(2) A license granted pursuant to paragraph (d)(1) of this section will include, as a condition on that license, that if a good faith agreement cannot be reached between the satellite operator and the operator of a future 2° compliant satellite, the earth station operator shall accept the power density levels that would accommodate the 2° compliant satellite.

(e)(1) An earth station applicant proposing to use transmitted satellite carrier EIRP densities, and/or maximum power into the antenna in excess of the levels in §§25.134, 25.211, 25.212, or the power density levels derived through the procedure set forth in paragraph (c)(1) of this section, whichever is applicable, shall provide the following certifications as an exhibit to its earth station application:

- (i) A statement from the specified satellite operator acknowledging that the proposed operation of the subject non-conforming earth station with its satellite(s) has the potential to create interference to adjacent satellite networks that may be unacceptable.
- (ii) A statement from the specified satellite operator that it has coordinated the operation of the subject non-conforming Earth Station accessing its satellite(s), and its corresponding downlink power density requirements (based on the information contained in the application) with all adjacent satellite networks within 6° of orbital separation from its satellite(s), and the operations will not violate any existing coordination agreement for its satellite(s) with other satellite systems.
- (iii) A statement from the specified satellite operator that it will include the subject non-conforming Earth Station power and power densities in all future satellite network coordinations, and
- (iv) A statement from the earth station applicant certifying that it will comply with all coordination agreements reached by the satellite operator(s).

(2) A license granted pursuant to paragraph (e)(1) of this section will include, as a condition on that license, that if a good faith agreement cannot be reached between the satellite operator and the operator of a future 2° compliant satellite, the earth station operator shall reduce its power to those levels that would accommodate the 2° compliant satellite.

(f)(1) If an earth station applicant requests transmit-only authority, and its proposed antenna does not conform to the standards of §25.209(a) and (b), it must meet the requirements of paragraphs (b) and (c) of this section.

(2) If an earth station applicant requests transmit-only authority, and its proposed power density levels are in excess of those specified in §§25.134, 25.211, or 25.212, or those derived by the procedure set forth in paragraph (c)(1) of this section, it must meet the requirements of paragraph (e) of this section.

(3) If an earth station applicant requests receive-only authority, and its proposed antenna does not conform to the standards of §25.209(a) and (b), it must meet the requirements of paragraphs (b) and (d) of this section.

(g) Applicants filing applications for earth stations pursuant to this section must provide the following information for the Commission's public notice:

- (1) Detailed description of the service to be provided, including frequency bands and satellites to be used. The applicant must identify either the specific satellites with which it plans to operate, or the eastern and western boundaries of the geostationary satellite orbit arc it plans to coordinate.
- (2) The diameter or equivalent diameter of the antenna.
- (3) Proposed power and power density levels.
- (4) Identification of any rule or rules for which a waiver is requested.

23. In § 25.271, add paragraph (c)(5) to read as follows:



§25.271 Control of transmitting earth stations.

\* \* \* \* \*

(c) \* \* \*

(5) International VSAT system operators are required to maintain a control point within the United States, or to maintain a point of contact within the United States available 24 hours a day, 7 days a week, with the ability to shut off any earth station within the VSAT network immediately upon notification of harmful interference.

\* \* \* \* \*

24. In § 25.274, revise paragraph (e), remove paragraph (g), redesignate paragraph (f) as new paragraph (g), and add new paragraph (f) to read as follows:

§25.274 Procedures to be followed in the event of harmful interference.

\* \* \* \* \*

(e) The earth station licensee whose operations are suspected of causing harmful interference to the operations of another earth station shall take reasonable measures to determine whether its operations are the source of the harmful interference problem. Where the operations of the suspect earth station are the source of the interference, the licensee of that earth station shall take all measures necessary to resolve the interference.

(f) Where the earth station suspected of causing harmful interference to the operations of another earth station cannot be identified or is identified as an earth station operating on a satellite system other than the one on which the earth station suffering harmful interference is operating, it is the responsibility of a representative of the earth station suffering harmful interference to contact the control center of other satellite systems. The operator of the earth station suffering harmful interference is free to choose any representative to make this contact, including but not limited to the operator of the satellite system on which the earth station is operating. The operator of the earth station suffering harmful interference is also free to contact the control center of the other satellite systems directly.

\* \* \* \* \*

25. Amend § 25.277 by revising paragraph (d) and adding paragraph (f) to read as follows:

§25.277 Temporary fixed earth station operations.

\* \* \* \* \*

(d) Except as set forth in Section 25.151(e) of this chapter, transmissions may not be commenced until all affected terrestrial licensees have been notified and the earth station operator has confirmed that unacceptable interference will not be caused to such terrestrial stations.

\* \* \* \* \*

(f) Filing requirements concerning applications for new temporary fixed earth station facilities operating in frequency bands shared co-equally with terrestrial fixed stations.

(1) When the initial location of the temporary fixed earth station's operation is known, the applicant shall provide, as part of the Form 312 application, a frequency coordination report in accordance with §25.203 for the initial station location.

(2) When the initial location of the temporary fixed earth station's operation is not known at the time the application is filed, the applicant shall provide, as part of the Form 312 application, a statement by the applicant acknowledging its coordination responsibilities under §25.277.

## APPENDIX C

### Summary of ASIA Analysis of 10, 13, and 16 dBW/4kHz Downlink EIRP Densities

#### I. Introduction

Sections 25.134(a) and 25.212(c) set a 6 dBW/4kHz criteria on the maximum Ku-band<sup>1</sup> downlink EIRP density<sup>2</sup> that can be routinely processed. A number of comments support increasing this downlink EIRP density criteria for the routine processing of earth station applications. Most commenters support increasing this criteria to 9 dBW/4kHz, and some commenters support increasing this criteria to 10 dBW/4kHz. The proposed 9 or 10 dBW/4kHz criteria would apply to all wideband and narrowband digital services. Other commenters propose the creation of a new routine processing criteria for wideband and dual carrier per transponder digital services. Criteria at both 13 dBW/4kHz and 16 dBW/4kHz have been proposed for these wideband and dual carrier per transponder services.

In this appendix, we summarize our examination of the interference impact of raising the downlink EIRP density criteria for routine processing. Based on those comments, as supplemented by our analysis summarized in this appendix, we conclude that increasing the Ku-band downlink EIRP density limit to 10 dBW/4kHz is consistent with the Commission's 2° spacing satellite technical standards. Our full analysis is included in the docket file for this proceeding and is publicly available.

The 6 dBW/4kHz routine processing criteria was originally established in the 1986 VSAT Order<sup>3</sup> and applied only to digital VSAT networks with outbound gross bit rates up to 3.088 Mbps. In the 1996 Streamlining Order,<sup>4</sup> this downlink EIRP density criteria was extended to all Ku-band digital transmissions, regardless of bandwidth or bit rate.

In 1985 and 1986, a number of VSAT earth station network applications were pending.<sup>5</sup> These applications proposed a variety of antenna sizes, data rates, uplink power density levels, and downlink EIRP density levels.<sup>6</sup> At that time, the Commission's interference analysis found that the highest downlink power density levels could cause excessive levels of interference into existing services<sup>7</sup> and accordingly limited the downlink EIRP density for routine processing to 6 dBW/4kHz.

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<sup>1</sup> Specifically, the downlink EIRP density limit being considered here applies only in the 11.7-12.2 GHz band.

<sup>2</sup> The 6 dBW/4kHz downlink EIRP density criteria applies only to the routine processing of wideband and narrowband digital services.

<sup>3</sup> Routine Licensing of Large Networks of Small Antenna Earth Stations Operating in the 12/14 GHz Frequency Bands, *Declaratory Order*, Common Carrier Bureau, Released Apr. 9, 1986 (1986 VSAT Order).

<sup>4</sup> Streamlining the Commission's Rules and Regulations for Satellite Application and Licensing Procedures, *Report and Order*, IB Docket No. 95-117, 11 FCC Rcd 21581 (1996) (1996 Streamlining Order).

<sup>5</sup> 1986 VSAT Order at n. 2.

<sup>6</sup> 1986 VSAT Order at para. 9. The highest downlink EIRP density proposed was +10.3 dBW/4kHz.

<sup>7</sup> 1986 VSAT Order at para. 15.

In order to assess the interference impact of raising this routine processing criteria to levels greater than 6 dBW/4kHz, the staff has preformed an ASIA<sup>8</sup> analysis using a series of baseline systems. *First*, an outbound digital VSAT reference system with 5.0 and 1.2 meter antennas operating at the routine processing levels of §25.134(a) and §25.212(c) was considered. This reference system consists of six (6) carrier links at both 6 dBW/4kHz and 10 dBW/4kHz downlink EIRP density levels<sup>9</sup>. *Second*, a narrowband analog reference system, with 5.0 and 1.2 meter antennas operating at the routine processing levels of §25.134(a) and §25.212(c) was also defined. This narrowband analog system consists of eight (8) carrier links providing audio program and voice grade circuits at both downlink EIRP density levels of 13 dBW/4kHz and 17.0 dBW/4kHz.<sup>10</sup> *Third*, a generic reference system of general communications carrier links was also considered. This system consists of 107 generic Ku-band carrier links. Some of these generic links were originally analyzed in Appendix C of the 1983 *Two Degree Spacing Order*<sup>11</sup> and later, these generic links were adjusted to include the domestic space station applications filed on November 7, 1983. These generic links were used in the staff's original analysis in the 1986 *VSAT Order*. The set of 107 generic links considered in this appendix is a revised version of those generic links used in the 1986 *VSAT Order*. Those used in the 1986 *VSAT Order* were reviewed and several obsolete links were removed.<sup>12</sup> Additionally a few new links from a recent space station application<sup>13</sup> were added to this set to complete the 107 generic links used in the analyses in this appendix.<sup>14</sup> Note that the receive satellite antenna gain and downlink EIRP levels for these generic links are generally characteristic of nominal edge of coverage.<sup>15</sup> *Fourth*, a set of baseline digital carriers, both wideband and narrowband, operating at the routine processing levels of §25.212(c) was considered. This baseline digital system consists of twelve carrier links

<sup>8</sup> The Adjacent Satellite Interference Analysis (ASIA) computer program and interference assessment methodology is cited in Section 25.134(b) of our Rules. The ASIA program and methodology was originally employed to analyze the impact of 2° orbital spacing in the C and Ku bands in Appendices B and C of the *Two Degree Spacing Order*. Specifically, version 1.2 of ASIA was used in the analyses considered in this appendix. Version 1.2 is identical to version 1.1, with the addition of listing the computed values of power density and EIRP density. The input data used in these analyses are listed in an expanded version of this appendix available in the Docket File, in tables C-25 through C-30. Source code for ASIA, input data files, and results of these analyses will be made available on the Commission's website.

<sup>9</sup> See tables C-1 and C-26 for the link parameters of the digital VSAT reference system.

<sup>10</sup> See tables C-2 and C-27 for the link parameters of this narrowband analog reference system.

<sup>11</sup> Licensing of Space Stations in the Domestic Fixed-Satellite Service and Related Revisions of Part 25 of the Rules and Regulations, *Report and Order*, CC Docket No. 81-704, FCC 83-184, 54 Rad. Reg. 2d 577 (released Aug. 16, 1983); Licensing Space Stations in the Domestic Fixed-Satellite Service, 48 F.R. 40233 (Sept. 6, 1983) (*Two Degree Spacing Order*).

<sup>12</sup> The 1986 *VSAT Order* generic links were adjusted by removing the following: (1) all digital non-VSAT-like BPSK links, (2) all analog FDM/FM and CSSB/AM multi-channel telephone links, (3) all narrowband analog SCPC/FM telephony links, (4) analog TV/FM distribution links to small antennas (< 3.0 meters), (5) all digital links with on-board satellite processing, and (6) links characteristic of satellite systems that were never built.

<sup>13</sup> Links characteristic of three (3) satellite systems (SES Americom, Loral, and PanAmSat) were added. The link parameters for these last 16 generic links come from the ASIA analysis presented in SES Americom's space station application for Americom-9 at 79° W.L. (Attachment B to SAT-LOA-20020114-00008, S2434, filed Jan. 14, 2002). The downlink receive earth station antenna gains for the Americom 2.4 and 6.0 meter antennas have been revised. The receive gain for the 2.4 meter antennas have been changed to 47.4 dBi from 41.3, 41.8, and 49.3 dBi. The receive gain for the 6.0 meter antenna has been changed to 55.3 dBi from 49.3 dBi.

<sup>14</sup> See tables C-3 and C-28 for the link parameters of the generic Ku band reference links.

<sup>15</sup> Downlink EIRP levels for the generic links are generally about 3 dB lower than for the peak EIRP levels at the satellite antenna pattern's boresite.

operating at both downlink EIRP density levels of 6 dBW/4kHz and 10 dBW/4kHz<sup>16</sup>. And *fifth*, a set of baseline full and dual wideband digital carrier links operating at the routine processing levels of §25.212(c) was considered. This wideband and dual carriers per transponder baseline system consists of 24 carrier links operating at downlink EIRP density levels of 6 dBW/4kHz, 10 dBW/4kHz, 13 dBW/4kHz, and 16 dBW/4kHz.<sup>17</sup>

## II. Interference Analysis Results

**20% Noise Allocation to Adjacent Satellite Interference:** Generally, for all but a few of the above described baseline systems,<sup>18</sup> the single entry adjacent satellite interference objectives used in the staff's analyses in this appendix have been based upon a 20% of noise allocation to total adjacent satellite interference.<sup>19</sup> This differs from the analyses conducted in the 1983 *Two Degree Spacing Order* and the 1986 *VSAT Order*. Before 1983, 10% of the noise budget, in most cases, was allocated to total adjacent satellite interference. With the implementation of uniform 2° orbital spacing, however, satellite operators began to increase their noise budget allocations to total adjacent satellite interference. Today the general practice is to allocate 20% of the noise budget to total adjacent satellite interference. This adjustment, while holding all other parameters constant, would allow for a 3 dB increase in uplink power density and downlink EIRP density levels<sup>20</sup> with respect to those established in the 1986 *VSAT Order*. Accordingly, this factor would allow the increase of the Ku-band downlink EIRP density criteria to 9 dBW/4kHz without causing harmful interference to most satellite systems in operation today.

Tables C-6 through C-25 summarize the results of the staff's ASIA analysis of these baseline systems.<sup>21</sup> Table C-0 summarizes the result tables for the various interference cases. For example, Table C-18 provides the summary results for the Digital-to-Generic interference case and Table C-18a provides the details for those Digital-to-Generic interference cases with negative margins. Below, we discuss the conclusions we draw from the analyses. As mentioned above, the tables and the underlying data are available in the docket file for this proceeding.

<sup>16</sup> See tables C-4 and C-29 for the link parameters of the baseline digital systems.

<sup>17</sup> See tables C-5 and C-30 for the link parameters of the wideband and dual carriers per transponder links.

<sup>18</sup> The last 16 links (SES Americom, Loral, and PanAmSat) in the 107 generic links are the exception. The single entry interference objectives for these links are as stated in Attachment B to the space station application, SAT-LOA-20020114-0008. See the last column of table C-28 for the single entry C/I ratio used for these last 16 links.

<sup>19</sup>  $C/I_{se} = C/N_{req} - 10 \log(0.20) - 10 \log(0.40) = C/N_{req} + 7 \text{ dB} + 4 \text{ dB} = C/N_{req} + 11 \text{ dB}$ . The single entry allocation is 40% of the total adjacent satellite allocation.

<sup>20</sup> A 10% of noise allocation to adjacent satellite interference gives a  $C/I_{se}$  which is 3 dB higher than with a 20% of noise allocation.  $C/I_{se} = C/N_{req} - 10 \log(0.10) - 10 \log(0.40) = C/N_{req} + 10 \text{ dB} + 4 \text{ dB} = C/N_{req} + 14 \text{ dB}$ .

<sup>21</sup> Negative margins in tables C-6 through C-25 are highlighted in a **bold font**. The C/I level in the worst link, either uplink or downlink, is also highlighted in a **bold font**.

Table C-0: Summary of ASIA Analysis Results (See the listed tables for results)

Victim Data Sets	Interfering Data Sets			
	Baseline VSAT (Tables C-1 & C-26)	Narrowband Analog SCPC/FM (Tables C-2 & C-27)	Baseline Digital (Tables C-4 & C-29)	Wideband & Dual Carrier (Tables C-5 & C-30)
Baseline VSAT (Tables C-1 & C-26)	Table C-6	Table C-11	Tables C-16 & C-16a	Tables C-21, C-21a, C-21b, and C-21c
Narrowband Analog SCPC/FM (Tables C-2 & C-27)	Tables C-7 & C-7a	Tables C-12 & C-12a	Tables C-17 & C-17a	Tables C-22, C-22a, C-22b, and C-22c
Generic Carriers (Tables C-3 & C-28)	Tables C-8 & C-8a	Tables C-13 & C-13a	Tables C-18 & C-18a	Tables C-23, C-23a, C-23b, and C-23c
Baseline Digital (Tables C-4 & C-29)	Table C-9	Table C-14	Tables C-19 & C-19a	Tables C-24 & C-24a
Wideband & Dual Carrier (Tables C-5 & C-30)	Table C-10	Table C-15	Tables C-20 & C-20a	Tables C-25 & C-25a

**A. 10 dBW/4kHz Downlink EIRP Densities:**

An examination of the summary results of the staff's ASIA analyses<sup>22</sup> indicates that very few communication links suffer negative margins from a 10 dBW/4kHz downlink EIRP density. Those cases that do experience negative margins are generally links operating at low levels of downlink EIRP density. Except for the case of narrowband analog SCPC/FM carriers, most of these links can increase their downlink EIRP density to compensate for the negative margins. Some of the analog SCPC/FM carriers that experience negative margins already operate at the routinely licensed downlink EIRP density level of 13 dBW/4kHz in §25.212. In order to recover a positive margin for these narrowband analog carriers, we have also increased their downlink EIRP density criteria by 4.0 dB to 17 dBW/4kHz. In the rest of this section, we examine the cases with negative margins in detail.

**A-1. Interference into VSAT network carriers.** Only link V4 has a negative margin from carriers operating at 10 dBW/4kHz downlink EIRP densities. Negative margins occur in tables C-16 and C-21 from medium to wideband digital carriers. Of the nine (9) cases with a negative margin, three (3) have negative margins of -0.5 dB, five (5) have negative margins of -0.6 dB, and one (1) has a negative margin of -0.9 dB.<sup>23</sup> Link V4 is a VSAT link between 1.2 meter antennas operating at a downlink EIRP density of 6 dBW/4kHz. The adoption of 10 dBW/4kHz downlink EIRP density criteria will allow this link to regain a positive margin by increasing its downlink EIRP density by 1.0 dB or less.

**A-2. Interference into Narrowband Analog Carriers.** Two (2) narrowband analog links have negative margins from carriers operating at 10 dBW/4kHz downlink EIRP densities. These carriers are FMot and VCot with negative margins in tables C-7, C-12, C-17, and C-22. An examination of the detailed C/I ratio levels in tables C-7a, C-12a, C-17a, and C-22a shows that these analog carriers have negative margins of -3.2 dB or less for interference from digital carriers and -3.6 dB or less for interference from high-powered narrowband analog carriers. These two (2) carriers (FMot and VCot) are outbound program-quality and voice-grade circuits from 5.0 meter to 1.2 meter antennas operating at the routine analog downlink EIRP

<sup>22</sup> See tables C-6, C-7, C-8, C-9, C-10, C-11, C-12, C-13, C-14, C-15, C-16, C-17, C-18, C-19, C-20, C-21, C-22, C-23, C-24, and C-25.

<sup>23</sup> See tables C-16a and C-21a for detailed C/I ratio levels.

density of 13 dBW/4kHz. In order to compensate for the shortfall in these SCPC/FM links, we have also examined the consequences of raising the routine processing level of the downlink EIRP density for narrowband analog signals. In particular, we have examined raising the downlink EIRP density limit for narrowband analog systems to 17 dBW/4kHz. This 4.0 dB downlink EIRP density increase allows these narrowband analog carriers to recover a positive margin by increasing their downlink EIRP densities.

**A-3. Interference into Generic carriers.** Twenty-three (23)<sup>24</sup> of the 107 generic carriers show negative margins from digital carriers operating at 10 dBW/4kHz and analog carriers operating at 17 dBW/4kHz downlink EIRP densities. In each of these cases, however, an increase in this downlink EIRP density would recover a positive margin for the carrier at issue.

**A-4. Interference into Digital carriers.** Only one (1) baseline digital carrier, D3-6, has a negative margin of -0.1 dB from carriers operating at 10 dBW/4kHz downlink EIRP densities. Negative margins occur in tables C-19 and C-24 from medium to wideband digital carriers. Tables C-19a and C-24a show that the shortfall for this carrier is only 0.1 dB. This carrier is operating at a downlink EIRP density of 6 dBW/4kHz. The adoption of 10 dBW/4kHz downlink EIRP density criteria will allow this link to regain a positive margin by slightly increasing its downlink EIRP density.

**A-5 Interference into Full & Dual Wideband Digital Carrier.** Only one (1) wideband digital carrier, 06M1, has a negative margin of -0.1 dB from carriers operating at 10 dBW/4kHz downlink EIRP densities. Negative margins occur in tables C-20 and C-25 from medium to wideband digital carriers. Tables C-20a and C-25a show that the shortfall for this carrier is only 0.1 dB. This carrier is operating at a downlink EIRP density of 6 dBW/4kHz. The adoption of 10 dBW/4kHz downlink EIRP density criteria will allow this link to regain a positive margin by slightly increasing its downlink EIRP density.

#### **B. 13 dBW/4kHz Downlink EIRP Densities:**

An examination of the summary results of the staff's ASIA analyses<sup>25</sup> indicates that a number of communication links suffer negative margins from a 13 dBW/4kHz downlink EIRP density for full and dual wideband digital carriers. With respect to interference into digital VSAT carriers operating at 10 dBW/4kHz only a failure of 0.1 dB is seen for link V5 in table C-21b. With respect to narrowband analog carriers operating at 17 dBW/4kHz failures of 2.2 and 0.2 dB are seen for links FMot+ and VCot+, respectively, in table C-22b. All margins are positive for 10 dBW/4kHz carriers in table 24 (digital carriers) and table 25 (full and dual wideband digital carriers).

With respect to interference into digital VSAT carriers operating at 6 dBW/4kHz, failures of 2.7 and 3.3 dB are seen for links V2 and V4, respectively, in table C-21b. With respect to narrowband analog carriers operating at 13 dBW/4kHz failures of 0.4, 6.1, and 4.1 dB are seen for links FMin, FMot, and VCot, respectively, in table C-22b. With respect to digital carriers operating at 6 dBW/4kHz only link D3-6 fails by 3.0 dB in table C-24a. With respect to full and dual wideband digital carriers operating at 6 dBW/4kHz, links 06M1 fails by 3.0 dB in table C-25a.

With respect to interference into the generic carriers, 56 of the 107 links show a negative margin in table C-23.

#### **C. 16 dBW/4kHz Downlink EIRP Densities:**

<sup>24</sup> The carriers with negative margins in tables C-8, C-13, C-18, and C-23 are N003, N035, N036, N037, N045, N046, N052, N053, N056, N057, N058, N073, N079, N087, N092, N093, N096, N097, N101, N103, N105, N106, and N107. The following links show a failure in the tables, however they have a margin of 0.0 dB: N040.

<sup>25</sup> See tables C-21, C-22, C-23, C-24, and C-25.

An examination of the summary results of the staff's ASIA analyses<sup>26</sup> indicates that the majority of communication links suffer negative margins from 16 dBW/4kHz downlink EIRP density for full and dual wideband digital carriers. In particular, VSAT links V2 and V4 fail by 5.4 and 6.0 dB respectively.<sup>27</sup> VSAT links V2 and V4 operate at 6 dBW/4kHz downlink EIRP density. Even increasing the downlink EIRP density to 10 dBW/4kHz for these two (2) links (V3 and V5) still causes 1.5 and 2.5 dB failures, respectively. Additionally, analog SCPC/FM links FMot and VCot fail by 9.1 and 7.1 dB, respectively.<sup>28</sup> These SCPC/FM links operate at 13 dBW/4kHz downlink EIRP density. Even increasing the downlink EIRP density to 17 dBW/4kHz for these two (2) narrowband analog links (FMot+ and VCot+) still causes 5.1 and 3.1 dB failures, respectively. Likewise, digital carrier D3-6 fails by 5.9 dB. This digital carrier operates at 6 dBW/4kHz. Even increasing the downlink EIRP density to 10 dBW/4kHz (link D3-X) still has a 2.0 dB failure.

### III. Conclusion

Analysis of 10 dBW/4kHz downlink EIRP density for VSAT and other digital carriers indicates that this level is compatible with 2° orbital spacings. The 4.0 dB increase in downlink EIRP density for digital carriers, however, will also require a 4.0 dB increase in the downlink EIRP density for narrowband analog SCPC/FM to 17 dBW/4kHz. Both of these increases are compatible with 2° orbital spacings.

Analysis of 13 dBW/4kHz downlink EIRP density for full and dual wideband digital carriers indicates that this level might require some adjustments to existing operations that presently conform to the current routine processing criteria of 6 dBW/4kHz (digital) and 13 dBW/4kHz (analog) in §25.212. Analysis of 16 dBW/4kHz downlink EIRP density for full and dual wideband digital carriers indicates that this level is not compatible with 2° orbital spacings.

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<sup>26</sup> See tables C-21, C-22, C-23, C-24, and C-25.

<sup>27</sup> See table C-21c.

<sup>28</sup> See table C-22c.



## APPENDIX D

OUTLINE OF CERTIFICATION PROCEDURE

Below is a step-by-step outline of the streamlined certification procedure for non-routine earth station applications seeking authority to use smaller-than-routine antennas or higher-than-routine power levels that we adopt in Sections III.E. of this Order.

- The earth station operator decides it wants to apply for a non-routine earth station license.
- The earth station operator contacts the GSO space station operator or operators with which it wants to communicate, and asks it/them to coordinate with other potentially affected space station operators located within six degrees of the target space station operator.
- The space station operators complete their coordination negotiations, and each target space station operator provides a statement to the earth station operator certifying that the coordination negotiations have been completed.
- The earth station operator files its applications, including the following certifications as attachments:
  - (i) A statement from the satellite operator acknowledging that the proposed operation of the subject non-conforming earth station with its satellite(s) has the potential to create interference to adjacent satellite networks that may be unacceptable.
  - (ii) A statement from the satellite operator that it has coordinated the operation of the subject non-conforming Earth Station accessing its satellite(s), and its corresponding downlink power density requirements (based on the information contained in the application) with all adjacent satellite networks within 6° of orbital separation from its satellite(s), and the operations will not violate any existing coordination agreement for its satellite(s) with other satellite systems.
  - (iii) A statement from the satellite operator that it will include the subject non-conforming Earth Station power and power densities in all future satellite network coordinations, and
  - (iv) A statement from the earth station applicant certifying that it will comply with all coordination agreements reached by the satellite operator(s).
- The Commission reviews the non-routine earth station application to determine whether it is acceptable for filing.
- Day 1: When the Commission completes its initial review, and if it finds that the application is acceptable for filing, the application is placed on public notice.
- Day 30: Comments are due. If the Commission receives no comments, it can act on the non-routine earth station application. If the Commission receives comments, then the 60-day coordination process is triggered. Informal comments are not sufficient to trigger this process. The commenter must identify specific target satellites, and sufficiently explain the

outstanding issues to enable the Commission to determine whether the comment is or is not frivolous.

- Day 90: The 60-day coordination process is complete. Either the target satellite operator has reached agreement with all the commenters, or the Commission can assume for purposes of the non-routine earth station application that the parties will not reach agreement. Thus, at this point, the Commission can consider all the issues to be "resolved." The Commission is not involved in these discussions.
- Day 104 (approximate): On average, within 10 business days after the end of the 60-day coordination process, the Commission will act on the earth station application. Generally, the application will be granted with respect to all target satellites that have reached agreement with all the commenters filing comments in response to that target satellite, and denied with respect to all other target satellites.

In the vast majority of cases, the Commission will allow applications to be granted with respect to target satellites for which coordination discussions have been completed, and otherwise denied. However, the Commission reserves the right to grant an application with respect to satellites with incomplete coordination agreements when the comments are frivolous, such as, for example, if someone files comments regarding a particular target satellite based on a dispute with the Commission in a different proceeding regarding a different issue and a different orbital location. The Commission also reserves the right to deny an application based on an issue it finds in its technical review, even if none of the commenters raised that issue.

## APPENDIX E

## FINAL REGULATORY FLEXIBILITY ANALYSIS

As required by the Regulatory Flexibility Act of 1980, as amended (RFA),<sup>1</sup> an Initial Regulatory Flexibility Analysis (IRFA) was incorporated in the *Notice of Proposed Rule Making* (*Notice*) and the *Further Notice of Proposed Rulemaking* (*Further Notice*) in IB Docket No. 00-248.<sup>2</sup> The Commission sought written public comment on the proposals in the *Notice* and *Further Notice*, including comment on the IRFA. This Final Regulatory Flexibility Analysis (FRFA) conforms to the RFA.<sup>3</sup>

**A. Need for, and Objectives of, the Report and Order**

The Telecommunications Act of 1996 requires the Commission in every even-numbered year beginning in 1998 to review all regulations that apply to the operations or activities of any provider of telecommunications service and to determine whether any such regulation is no longer necessary in the public interest due to meaningful economic competition. Our objective is to repeal or modify any rules in Part 25 that are no longer necessary in the public interest, as required by Section 11 of the Communications Act of 1934, as amended.

We codify streamlined procedures for case-by-case examination of earth stations using "non-routine" antennas, non-routine power levels, or both. We also relax the downlink EIRP power spectral density limits for Ku-band VSAT systems. Finally, we will allow some temporary fixed earth stations to begin operation sooner than is now permitted.

**B. Summary of Significant Issues Raised by Public Comments In Response to the IRFA**

No comments were submitted directly in response to the IRFAs in either the *Notice* or the *Further Notice*.

**C. Description and Estimate of the Number of Small Entities To Which Rules Will Apply**

The RFA directs agencies to provide a description of, and, where feasible, an estimate of, the number of small entities that may be affected by the rules adopted herein.<sup>4</sup> The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."<sup>5</sup> In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.<sup>6</sup> A small business concern is one which: (1) is independently owned and operated;

<sup>1</sup> See 5 U.S.C. § 603. The RFA, see 5 U.S.C. § 601 – 612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Title II, 110 Stat. 857 (1996).

<sup>2</sup> 2000 Biennial Regulatory Review -- Streamlining and Other Revisions of Part 25 of the Commission's Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth Stations and Space Stations, *Notice of Proposed Rulemaking*, IB Docket No. 00-248, 15 FCC Rcd 25128 (2000) (*Notice*); 2000 Biennial Regulatory Review -- Streamlining and Other Revisions of Part 25 of the Commission's Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth Stations and Space Stations, *Notice of Proposed Rulemaking*, IB Docket No. 00-248, 17 FCC Rcd 18585 (2002) (*Further Notice*).

<sup>3</sup> See 5 U.S.C. § 604.

<sup>4</sup> 5 U.S.C. § 604(a)(3).

<sup>5</sup> 5 U.S.C. § 601(6).

<sup>6</sup> 5 U.S.C. § 601(3) (incorporating by reference the definition of "small business concern" in 15

(2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (SBA).<sup>7</sup>

1. Cable Services. The SBA has developed a small business size standard for Cable and Other Program Distribution, which consists of all such firms having \$12.5 million or less in annual receipts.<sup>8</sup> According to Census Bureau data for 1997, in this category there was a total of 1,311 firms that operated for the entire year.<sup>9</sup> Of this total, 1,180 firms had annual receipts of under \$10 million, and an additional fifty-two firms had receipts of \$10 million to \$24,999,999.<sup>10</sup> Thus, under this size standard, the majority of firms can be considered small.

The Commission has developed its own small business size standard for a small cable operator for the purposes of rate regulation. Under the Commission's rules, a "small cable company" is one serving fewer than 400,000 subscribers nationwide.<sup>11</sup> Based on our most recent information, we estimate that there were 1,439 cable operators that qualified as small cable companies at the end of 1995.<sup>12</sup> Since then, some of those companies may have grown to serve over 400,000 subscribers, and others may have been involved in transactions that caused them to be combined with other cable operators. Consequently, we estimate that there are fewer than 1,439 small cable companies that may be affected by the proposed rules.

The Communications Act of 1934, as amended, also contains a size standard for a "small cable operator," which is "a cable operator that, directly or through an affiliate, serves in the aggregate fewer than one percent of all subscribers in the United States and is not affiliated with any entity or entities whose gross annual revenues in the aggregate exceed \$250,000,000."<sup>13</sup> The Commission has determined that there are 67,700,000 subscribers in the United States.<sup>14</sup> Therefore, an operator serving fewer than 677,000 subscribers shall be deemed a small operator, if its annual revenues, when combined with the total annual revenues of all of its affiliates, do not exceed \$250 million in the aggregate.<sup>15</sup> Based on available data, we estimate that the number of cable operators serving 677,000 subscribers or less totals approximately 1,450.<sup>16</sup> We do not request or collect information on whether cable operators are affiliated with entities whose gross annual revenues exceed \$250,000,000,<sup>17</sup> and therefore are unable to estimate accurately the

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U.S.C. § 632). Pursuant to the RFA, the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register." 5 U.S.C. § 601(3).

<sup>7</sup> 15 U.S.C. § 632.

<sup>8</sup> 13 C.F.R. § 121.201, NAICS code 517510.

<sup>9</sup> U.S. Census Bureau, 1997 Economic Census, Subject Series: Information, "Establishment and Firm Size (Including Legal Form of Organization)," Table 4, NAICS code 513220 (issued October 2000).

<sup>10</sup> *Id.*

<sup>11</sup> 47 C.F.R. § 76.901(e). The Commission developed this definition based on its determinations that a small cable company is one with annual revenues of \$100 million or less. *See Implementation of Sections of the Cable Television Consumer Protection and Competition Act of 1992: Rate Regulation*, MM Doc. Nos. 92-266 and 93-215, Sixth Report and Order and Eleventh Order on Reconsideration, 10 FCC Rcd 7393, 7408-7409 ¶¶ 28-30 (1995).

<sup>12</sup> Paul Kagan Assocs., Inc., Cable TV Investor, Feb. 29, 1996 (based on figures for Dec. 30, 1995).

<sup>13</sup> 47 U.S.C. § 543(m)(2).

<sup>14</sup> *See FCC Announces New Subscriber Count for the Definition of Small Cable Operator*, Public Notice, 16 FCC Rcd 2225 (2001).

<sup>15</sup> 47 C.F.R. § 76.1403(b).

<sup>16</sup> *See FCC Announces New Subscriber Count for the Definition of Small Cable Operator*, Public Notice, 16 FCC Rcd 2225 (2001).

<sup>17</sup> We do receive such information on a case-by-case basis only if a cable operator appeals a local

number of cable system operators that would qualify as small cable operators under the definition in the Communications Act.

2. Satellite Telecommunications. The rules proposed in this *Further Notice* would affect providers of satellite telecommunications services, if adopted. Satellite telecommunications service providers include satellite operators and earth station operators. The Commission has not developed a definition of small entities applicable to satellite operators. Therefore, the applicable definition of small entity is generally the definition under the SBA rules applicable to Satellite Telecommunications.<sup>18</sup> This definition provides that a small entity is expressed as one with \$12.5 million or less in annual receipts.<sup>19</sup> 1997 Census Bureau data indicate that, for 1997, 273 satellite communication firms had annual receipts of under \$10 million. In addition, 24 firms had receipts for that year of \$10 million to \$24,999,990.<sup>20</sup>

3. Auxiliary, Special Broadcast and other program distribution services. This service involves a variety of transmitters, generally used to relay broadcast programming to the public (through translator and booster stations) or within the program distribution chain (from a remote news gathering unit back to the station). The Commission has not developed a definition of small entities applicable to broadcast auxiliary licensees. Therefore, the applicable definition of small entity is the definition under the Small Business Administration (SBA) rules applicable to radio broadcasting stations,<sup>21</sup> and television broadcasting stations.<sup>22</sup> These definitions provide that a small entity is one with either \$6.0 million or less in annual receipts for a radio broadcasting station or \$12.0 million in annual receipts for a TV station.<sup>23</sup> There are currently 3,237 FM translators and boosters, 4913 TV translators.<sup>24</sup> The FCC does not collect financial information on any broadcast facility and the Department of Commerce does not collect financial information on these auxiliary broadcast facilities. We believe, however, that most, if not all, of these auxiliary facilities could be classified as small businesses by themselves. We also recognize that most translators and boosters are owned by a parent station which, in some cases, would be covered by the revenue definition of small business entity discussed above. These stations would likely have annual revenues that exceed the SBA maximum to be designated as a small business (as noted, either \$6.0 million for a radio station or \$12.0 million for a TV station). Furthermore, they do not meet the Small Business Act's definition of a "small business concern" because they are not independently owned and operated.

4. Microwave Services. Microwave services include common carrier,<sup>25</sup> private-operational fixed,<sup>26</sup> and broadcast auxiliary radio services.<sup>27</sup> At present, there are

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franchise authority's finding that the operator does not qualify as a small cable operator pursuant to section 76.901(f) of the Commission's rules. See 47 C.F.R. § 76.990(b).

<sup>18</sup> "This industry comprises establishments primarily engaged in providing point-to-point telecommunications services to other establishments in the telecommunications and broadcasting industries by forwarding and receiving communications signals via a system of satellites or reselling satellite telecommunications." Small Business Administration, NAICS code 517310.

<sup>19</sup> 13 C.F.R. § 120.121, NAICS code 517310.

<sup>20</sup> U.S. Census Bureau, 1997 Economic Census, Subject Service: Information, "Establishment and Firm Size," Table 4, NAICS 513340 (Issued Oct. 2000).

<sup>21</sup> 13 CFR § 121.201, NAICS code 515112.

<sup>22</sup> 13 CFR § 121.201, NAICS code 515120.

<sup>23</sup> 13 C.F.R. § 121.201.

<sup>24</sup> FCC News Release, Broadcast Station Totals as of September 30, 1999, No. 71831 (Jan. 21, 1999).

<sup>25</sup> See 47 CFR § 101 *et seq.* (formerly, part 21 of the Commission's Rules).

<sup>26</sup> Persons eligible under parts 80 and 90 of the Commission's rules can use Private Operational-

approximately 22,015 common carrier fixed licensees and 61,670 private operational-fixed licensees and broadcast auxiliary radio licensees in the microwave services. The Commission has not yet defined a small business with respect to microwave services. For purposes of this FRFA, we will use the SBA's definition applicable to cellular and other wireless communications companies -- *i.e.*, an entity with no more than 1,500 persons.<sup>28</sup> We estimate that all of the Fixed Microwave licensees (excluding broadcast auxiliary licensees) would qualify as small entities under the SBA definition for radiotelephone (wireless) companies.

#### **D. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements**

The rules adopted in this *Fifth Report and Order* are not intended to increase the reporting, record keeping and other compliance requirements of any licensee, and we do not anticipate any differential treatment to be received by larger and smaller entities. The reporting requirements we adopt in this *Fifth Report and Order* generally replace the more burdensome Adjacent Satellite Interference Analysis (ASIA) requirement. These requirements will not affect small businesses differently from other non-routine earth station applicants.

Specifically, instead of the more burdensome ASIA requirement, non-routine earth station applicants under the new rules will be required to provide the following information: (1) A detailed description of the service to be provided, including frequency bands and satellites to be used. The applicant must identify either the specific satellite(s) with which it plans to operate, or the eastern and western boundaries of the arc it plans to coordinate. (2) The diameter or equivalent diameter of the antenna. (3) Proposed power and power density levels. (4) Identification of any random access technique, if applicable. (5) Identification of a specific rule or rules for which a waiver is requested.

In addition, non-routine earth station applicants choosing to use the certification procedure will be required under the new rules to provide certifications showing that the satellite operators with whom they plan to communicate have coordinated their operations with adjacent satellite operators.

Finally, all earth station applicants planning to operate in government/non-government frequency bands must provide information on half-power beam width of the earth station antenna under the new rules.

#### **E. Steps Taken to Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered**

The RFA requires an agency to describe any significant alternatives that it has considered in reaching its proposed approach, which may include the following four alternatives: (1) the

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Fixed Microwave services. See 47 CFR parts 80 and 90. Stations in this service are called operational-fixed to distinguish them from common carrier and public fixed stations. Only the licensee may use the operational-fixed station, and only for communications related to the licensee's commercial, industrial, or safety operations.

<sup>27</sup> Auxiliary Microwave Service is governed by part 74 of Title 47 of the Commission's Rules. See 47 CFR part 74 *et seq.* Available to licensees of broadcast stations and to broadcast and cable network entities, broadcast auxiliary microwave stations are used for relaying broadcast television signals from the studio to the transmitter, or between two points such as a main studio and an auxiliary studio. The service also includes mobile TV pickups, which relay signals from a remote location back to the studio.

<sup>28</sup> See 13 CFR § 121.201, NAICS code 517212.

establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.<sup>29</sup>

This *Fifth Report and Order* adopts procedures that will allow faster and easier processing of non-routine earth station applications. One of the proposals adopted here is to license non-routine earth station operators upon a showing that they will lower their power levels to reduce the potential for harmful interference. The Commission specifically considered and rejected a proposal to require such earth station operators to provide certifications that their non-routine operations have been coordinated with adjacent satellite operators. Requiring certifications in addition to power reductions, instead of as an alternative to power reductions, would have been more burdensome to all earth station operators, including those that are small entities. Thus, rejection of that proposal benefits all earth station applicants, including small entities.

In this *Fifth Report and Order*, the Commission also increases the downlink EIRP power spectral density limits for Ku-band VSAT systems. One alternative was to keep the previous power spectral density limits. The Commission rejected that alternative because increasing the power limit increases flexibility and thus decreases regulatory burdens for all VSAT network operators, including small VSAT network operators.

Finally, in this *Fifth Report and Order*, the Commission adopts rules allowing routine Ku-band temporary-fixed earth station operators to begin operation sooner than is now permitted. One alternative was to keep the previous requirements, which prohibited all temporary-fixed earth station operators from operating before the end of a notice-and-comment period. The Commission rejected that alternative because allowing earlier operation decreases regulatory burdens for all routine Ku-band temporary-fixed earth station operators, including small earth station operators falling in this category.

#### F. Report to Congress

The Commission will send a copy of the *Fifth Report and Order*, including this FRFA, in a report to be sent to Congress pursuant to the Congressional Review Act, see 5 U.S.C. § 801(a)(1)(A). In addition, the Commission will send a copy of the *Fifth Report and Order*, including FRFA, to the Chief Counsel for Advocacy of the Small Business Administration. A copy of the *Fifth Report and Order* and FRFA (or summaries thereof) will also be published in the Federal Register. See 5 U.S.C. § 604(b).

<sup>29</sup>

5 U.S.C. §§ 603(c)(1) – (c)(4).